NASA Educational CD-ROMs – Research and Evaluation. Rebecca Knudsen, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena CA 91109 (Rebecca.Knudsen@jpl.nasa.gov)

ABSTRACT

Introduction: Since the introduction of educational technology in the K-12 classroom, educators have been flooded with a seemingly endless stream of educational CD-ROMs. NASA has contributed to this new trend in educational technology by developing a wide range of some of the latest, most high-tech CD-ROMs in the industry. In this rapidly changing field, every advance seems to promise new hopes and success, and the analysis of the previous educational software models becomes irrelevant. As a consequence, virtually no research has been done to determine the usefulness of educational software packages in the K-12 classroom, either within NASA or the larger educational community [1]. Thus, developers who invest their time and money into these educational CD-ROMs are left to make educated guesses as to what features and qualities of software the educational community prefers and uses.

Literature Search: The literature search indicated certain trends in CD-ROM use in the K-12 classroom. Educators seem to be interested in CD-ROMs that can be used across contexts, are interactive, that promote learning in their students, and that match their curriculum standards. The types of CD-ROMs most commonly found in the classroom are (1)electronic encyclopedias, (2)research/reference materials, and (3)artwork/image CD-ROMs [2,3]. Educators typically use educational CD-ROMs outside of the classroom to create instructional materials and gather information for lessons, with a small percentage using them to the create multimedia presentations and access model lesson plans. The most common CD-ROM-based assignments educators were found to give to their students were practice drills, research assignments, problem solving and data analysis [4].

The most astounding conclusion, and perhaps the reason that so little research has been done on this topic, is that a very small percentage of our nation's educators are consistently using educational CD-ROMs in their instruction. Teachers face an overwhelming number of barriers when attempting to implement this form of educational technology. Some of these barriers include (1)high costs of the CD-ROM packages, (2)preparation and utilization time, (3)curriculum standards and testing pressures, (4)perceived poor quality of the CD-ROMs, and (5)technical difficulties [5]. Due to this void in research on the utilization of educational CD-ROMs, it was understandably difficult to find anything conclusive about the use of NASA's educational CD-ROMs. It was necessary, therefore, to conduct our own study.

Study Methodology: The study consisted of both quantitative and qualitative research. After a series of collaborations with a number of NASA's current educational CD-ROM developers, a Likert scale questionnaire was carefully construced to elicit quantitative data. The questionnaire was put on-line, and an invitation to respond was sent by email to approximately 4000 educators. These educators were chosen on the basis of having received one of the following CD-ROMs; *Visit to an Ocean Planet (TOPEX/Poseidon Mission), Winds of Change (NSCAT Mission),* and *Ways of Seeing (Cassini Mission).* To elicit a higher response rate, educational posters and CD-ROMs were offered to those who completed the questionnaire.

Qualitative data was gathered in a series of telephone initerviews with the questionnaire respondents whom had indicated they were willing to participate. All interviews were recorded to ensure quality and accuracy. Both forms of data collection were considered in the data analysis and conlusions of this study.

References: [1] Ehrmann, Stephen C. (1997) *Valuable Viable Software in Education: Cases and Analysis,* 2-3. [2] Christie, Earl N. III. (1999) *CD-ROM Networking in K-12 Schools,* In Prime Array Network, Digital Schools. Available http://www.oai.com. [3] Becker, Henry J. (1999) *Teacher and Teacher-Directed Student Use of Computers and Software,* 13-14. [4] National Center for Education Statistics (2000). *Teachers' Tools for the 21st Century, A Report on Teachers' Use of Technology,* 11-22. [5] Hoff, D. (1999). Digital Content and the Curriculum. In Technology Counts 99. Available at http://www.edweek.org/sreports/tc99/articles/survey.htm#key

BIOGRAPHY

Rebecca Knudsen works both for the Office of Education and Public Outreach at JPL, and for the OSS Solar System Exploration E/PO Forum. She specializes in educational research and evaluation, with a focus on trends in the K-12 classroom. Some of her research interests include educational technology, curriculum standards correlation, and educational needs assessment. She received a B.S. in psychology from Brigham Young University, and is currently pursuing her graduate studies at Loma Linda University.